Claims

1. A polypeptide comprising the following amino acid sequence :
$X_1X_2X_3X_4X_5X_6SWSNKSX_7X_8X_9X_{10}X_{11}$ (I),

wherein X_1, X_2, X_3, X_5, X_6, X_7, X_9, X_{10}, and X_{11} mean, independently one from each other, any amino acid residue, X_4 means any amino acid residue except A and W, and wherein X_8 means any amino acid residue except E and S.

2. The polypeptide according to claim 1, comprising the following amino acid sequence :
PWASNASWSNKSLDDIW (II).

3. The polypeptide according to claim 1, consisting of the following amino acid sequence :
PWASNASWSNKSLDDIW (II).

4. A pharmaceutical composition for preventing or treating a disease linked to the infection of an individual with a virus of the HIV family, which comprises an effective amount of a ligand compound which specifically binds to the polypeptide according to anyone of claims 1-3 in combination with at least one physiologically acceptable excipient.

5. The pharmaceutical composition according to claim 4, wherein said ligand compound consists of an antibody directed to the polypeptide according to anyone of claims 1-3.

6. A pharmaceutical composition for treating a cancer, which comprises an effective amount of an antigenic compound comprising or consisting of a polypeptide according to anyone of claims 1-3, in combination with at least one physiologically acceptable excipient.

7. An immunogenic composition comprising a polypeptide according to anyone of claims 1-3, in combination with at least one physiologically acceptable excipient.

8. A vaccine composition comprising a polypeptide according to claims 1-3 and an immunoadjuvant compound.

9. The vaccine composition of claim 8, wherein said antigenic compound comprises from 2 to 12 peptides of formula "SWSNKS".

10. The vaccine composition according to claim 9, wherein said antigenic compound has the following formula (III) :

NH_2-PepNt-$[(I)_n$-$PepX_n]_n$-PepCt- COOH (III),

wherein :

- "PepNt" consists of a polypeptide having an amino acid length varying from 0 to 100 amino acid residues and located at the N-terminal end of the polypeptide of formula (III) ;
- "$[(I)_n$-$PepX_n]$" consists of a polypeptide unit wherein :
  - "$(I)_1$" to - "$(I)_n$" each consists of, one independently from each other, a polypeptide of formula "SWSNKS", with n being an integer from 1 to 12; and
  - "$PepX_1$" to "$PepX_n$" each consists of, one independently from the other, a spacer polypeptide having an amino acid length varying from 0 to 30 amino acid residues, with n being an integer from 1 to 12;
- n is the number of $[(I)_n$-$PepX_n]$ polypeptide units in said polypeptide, with n being an integer from 1 to 12; and
- "PepCt" consists of a polypeptide having an amino acid length varying from 0 to 100 amino acid residues and located at the C-terminal end of the polypeptide of formula (III).

11. The vaccine composition according to anyone of claims 8-10 wherein the immunoadjuvant compound is selected in the group consisting of Freund complete adjuvant, Freund incomplete adjuvant, aluminium hydroxide, calcium phosphate, aluminium phosphate, potassium phosphate, Cholera toxin (CT) and its B subunit (CTB), toxins from *Bordetella pertusssis* (PT), labile toxin (LT) from *Escherichia coli*, monophosphoryl lipid A, CpG oligonucleotides, imidazoquinolones, oil in water emulsions comprising squalene and synthetic copolymers, muramyl dipeptides and their derivatives, saponins and immunostimulating complexes (ISCOMs), and dimethyldioctadecylammonium bromide or chloride (DDA).

12. The vaccine composition according to anyone of claims 8-11, wherein said antigenic compound is covalently linked through an amino acid residue to a carrier protein or to a synthetic polymer.

13. The vaccine composition according to claim 12, wherein said carrier protein is selected from the group consisting of keyhole limpet hemocyanin (KLH), bovine serum albumin, or diphtheria toxoid.

14. The vaccine composition according to claim 12, wherein said synthetic polymer is a multiple branch peptide construction comprising a core matrix comprised of lysine residues.

15. The vaccine composition according to anyone of claims 11-13 wherein there is a spacer between said polypeptide and said carrier protein or synthetic polymer.

16 A vaccine composition comprising a polypeptide comprising the amino acid sequence SWSNKS, said polypeptide being covalently linked

through an amino acid residue to a carrier protein or to a synthetic polymer.

17 The vaccine composition according to claim 16, wherein said carrier protein is selected from the group consisting of keyhole limpet hemocyanin (KLH), bovine serum albumin, or diphtheria toxoid.

18 The vaccine composition according to claim 15, wherein said synthetic polymer is a multiple branch peptide construction comprising a core matrix comprised of lysine residues.

19 The vaccine composition according to claims 16-18 wherein there are spacers between said polypeptide and said carrier protein or synthetic polymer.

20 A method for the *in vitro* screening of compounds for preventing or treating a disease linked with the infection of an individual with an HIV virus, wherein said method comprises the steps of :

(i) incubating a candidate compound to be tested with a polypeptide according to anyone of claims 1-3,

(ii) assaying for the binding of the candidate compound to be tested with a polypeptide according to anyone of claims 1-3.

21. The method according to claim 20, wherein step (ii) consists of subjecting to a gel migration assay the mixture obtained at the end of step (i) and detecting the complexes formed between the candidate compound and a polypeptide according to anyone of claims 1-3.

22. A method for the *in vitro* screening of compounds for preventing or treating a disease linked with the infection of an individual with an HIV virus, wherein said method comprises the steps of :

a) (i) bringing into contact a first CD4+ T-cell culture with a candidate compound, and HIV virus ;
(ii) bringing into contact a second CD4+ T-cell culture with HIV virus, in the absence of said candidate compound ; and
b) detecting the presence of NKp44L at the CD4+ T-cells surface issued from the culture (i) and (ii).

23. The method according to claim 22, comprising an additional step (c) which consists of selecting positively the candidate compound as a therapeutical agent when the level of expression of NKp44L at the CD4+ T-cells surface issued from the culture (ii) is higher than the level of expression of NKp44L at the CD4+ T-cells surface issued from the culture (i).

24 A method for the *in vitro* screening of compounds for preventing or treating a disease linked with the infection of an individual with an HIV virus, wherein said method comprises the steps of :
(i) submitting a candidate compound to a screening method according to anyone of claims 20 and 21, and
(ii) submitting a candidate compound positively selectionned at step (i) to the screening method according to anyone of claim 22 and 23.

25 A method for the *in vitro* assessment of the progression status of the infection of an individual with an HIV virus, wherein said method comprises the step of detecting in a sample from said individual, antibodies directed against a polypeptide according to anyone of claims 1-3.

26 The use of a ligand compound which specifically binds to the polypeptide according to anyone of claims 1-3, for manufacturing a

pharmaceutical composition for preventing or treating a disease linked to the infection of an individual with a virus of the HIV family.

27 The use of a polypeptide according to anyone of claims 1-3, for manufacturing a vaccine composition for treating a disease linked to the infection of an individual with a virus of the HIV family.

28 An antibody directed against a polypeptide according to claims 1-3.